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1 Routine/Function Prologues

1.0.1 noah_writerst.F90 (Source File: noah_writerst.F90)

This program writes restart files for NOAH. This includes all relevant water/energy storages, tile information, and time information. It also rectifies changes in the tile space.

REVISION HISTORY:

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1 Oct 1999: Jared Entin; Initial code
15 Oct 1999: Paul Houser; Significant F90 Revision
05 Sep 2001: Brian Cosgrove; Modified code to use Dag Lohmann's NOAA
             initial conditions if necessary. This is controlled with
             local variable NOAAIC. Normally set to 0 in this subroutine
             but set to 1 if want to use Dag's NOAA IC's. Changed output
             directory structure, and commented out if-then check so that
             directory is always made.
28 Apr 2002: Kristi Arsenault; Added NOAH LSM into LDAS
28 May 2002: Kristi Arsenault; For STARTCODE=4, corrected SNEQV values
             and put SMC, SH20, STC limit for GDAS and GEOS forcing.
14 Jun 2003: Sujay Kumar , Separated the write restart from the original
             code

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RESTART FILE FORMAT(fortran sequential binary):

```

YR,MO,DA,HR,MN,SS,VCLASS,NCH !Restart time,Veg class,no.tiles, no.soil lay
TILE(NCH)%COL                !Grid Col of Tile
TILE(NCH)%ROW                !Grid Row of Tile
TILE(NCH)%FGRD               !Fraction of Grid covered by tile
TILE(NCH)%VEGT               !Vegetation Type of Tile
NOAH(NCH)%STATES             !Model States in Tile Space

```

INTERFACE:

```

subroutine noah_writerst()
!uses:
use lisdrv_module, only : lis,tile
use time_module
USE noah_varder          ! NOAH tile variables
use time_manager
use tile_spmdMod

```

CONTENTS:

```

if ( masterproc ) then

    if ( ( lis%t%gmt == ( 24 - noahdrv%writeintn ) ) &
        .or. lis%t%endtime == 1 ) then

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!-----
! Restart Writing (2 files are written = active and archive)
!-----

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allocate(tmptilen(lis%d%glnbch))
open(40,file=noahdrv%noah_rfile,form='unformatted') !Active archive restart
call timemgr_write_restart(40)
write(40) lis%p%vclass,lis%d%lnc,lis%d%lnr,lis%d%glnbch !Veg class, no tiles
write(40) noah%t1 !NOAH Skin Temperature (K)
write(40) noah%cmc !NOAH Canopy Water Content
write(40) noah%snowh !NOAH Actual Snow Depth
write(40) noah%sneqv !NOAH Water Equivalent Snow Depth
do l=1,4
  do t=1,lis%d%glnbch
    tmptilen(t)=noah(t)%stc(1)
  enddo
  write(40) tmptilen !NOAH Soil Temperature (4 layers)
enddo
do l=1,4
  do t=1,lis%d%glnbch
    tmptilen(t)=noah(t)%smc(1)
  enddo
  write(40) tmptilen !NOAH Total Soil Moist. (4 layers)
enddo
do l=1,4
  do t=1,lis%d%glnbch
    tmptilen(t)=noah(t)%sh2o(1)
  enddo
  write(40) tmptilen !NOAH Liquid Soil Moist. (4 layers)
enddo
write(40) noah%ch !NOAH Heat/Moisture Sfc Exchange Coef.
write(40) noah%cm !NOAH Momentum Sfc Exchange Coef.
close(40)
write(*,*)'Noah Active restart written: ',noahdrv%noah_rfile
write(unit=temp,fmt='(i4,i2,i2,i2)') lis%t%yr,lis%t%mo, &
  lis%t%da,lis%t%hr
read(unit=temp,fmt='(10a1)')ftime
do i=1,10
  if(ftime(i).eq.( ' '))ftime(i)='0'
enddo
write(unit=temp,fmt='(a4,i3,a6,i4,a1,i4,i2,i2,a6,i3,a1)') &
  '/EXP',lis%o%expcode,'/NOAH/',lis%t%yr, &
  '/',lis%t%yr,lis%t%mo, &
  lis%t%da,'/LIS.E',lis%o%expcode,'.'
read(unit=temp,fmt='(80a1)') (fname(i),i=1,37)
do i=1,37
  if(fname(i).eq.( ' '))fname(i)='0'
enddo
write(unit=temp,fmt='(a9)')'mkdir -p '
read(unit=temp,fmt='(80a1)') (fmkdir(i),i=1,9)
write(unit=temp,fmt='(a4,i3,a6,i4,a1,i4,i2,i2)') &
  '/EXP',lis%o%expcode,'/NOAH/', &

```

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        lis%t%yr, '/' ,lis%t%yr,lis%t%mo,lis%t%da
read(unit=temp,fmt='(80a1)') (fyrmodir(i),i=1,26)
do i=1,26
    if(fyrmodir(i).eq.( ' '))fyrmodir(i)='0'
enddo

write(unit=temp,fmt='(a8)')'.Noahrst'
read(unit=temp,fmt='(80a1)') (fsubs(i),i=1,8)

write(unit=temp,fmt='(a40)') lis%%odir
read(unit=temp,fmt='(80a1)') (fbase(i),i=1,80)
c=0
do i=1,80
    if(fbase(i).eq.( ' ')).and.c.eq.0)c=i-1
enddo
write(unit=temp,fmt='(80a1)')(fbase(i),i=1,c),(fname(i),i=1,37), &
    (ftime(i),i=1,10),(fsubs(i),i=1,8)
read(unit=temp,fmt='(a80)')filen

write(unit=temp,fmt='(80a1)')(fmkdir(i),i=1,9),(fbase(i),i=1,c), &
    (fyrmodir(i),i=1,26)
read(unit=temp,fmt='(a80)')mkfyrmo

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!-----
! Archive File Name Generation Complete
! Make the directories for the NOAH restart file
!-----

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CALL SYSTEM(MKFYRMO)

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!-----
! Archive File Name Generation Complete
!-----

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open(40,file=filen,status='unknown',form='unformatted')
write(40) lis%p%vclass,lis%d%lnc,lis%d%lnr,lis%d%glbnch !veg class, no tiles
write(40) noah%t1 !noah skin temperature (k)
write(40) noah%cmc !noah canopy water content
write(40) noah%snowh !noah actual snow depth
write(40) noah%sneqv !noah water equivalent snow depth
do l=1,4
    do t=1,lis%d%glbnch
        tmptilen(t)=noah(t)%stc(1)
    enddo
    write(40) tmptilen !noah soil temperature (4 layers)
enddo
do l=1,4
    do t=1,lis%d%glbnch
        tmptilen(t)=noah(t)%smc(1)
    enddo
    write(40) tmptilen !noah total soil moist. (4 layers)

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```
    enddo
    do l=1,4
        do t=1,lis%d%glnch
            tmptilen(t)=noah(t)%sh2o(l)
        enddo
        write(40) tmptilen !noah liquid soil moist. (4 layers)
    enddo
    write(40) noah%ch      !noah heat/moisture sfc exchange coef.
    write(40) noah%cm     !noah momentum sfc exchange coef.

    close(40)

    write(*,*)'noah archive restart written: ',filen
    deallocate(tmptilen)
endif
endif
return
```